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Johnson Space Center
Houston, Texas

From: Colorado School of Mines
Department of Geology

Subject: Progress Letter Report for period 29 May 1973 to 30 June 1973

Title: Geologic and Mineral and Water Resources Investigations in Western Colorado, Using Skylab EREP Data (Contract No. NAS 9-13394, Proposal No. EREP 380)

INTRODUCTION

The primary objective of the CSM Skylab Program is to analyze EREP data for geologic information. To this end, the research has been subdivided into the following tasks:

Task I. The PI shall assist NASA/MSC in mission planning activities related to the proposed investigation.

Task II. The investigator will screen all EREP data obtained over Colorado and will select frames for detailed study.

Task III. The investigator will prepare photogeologic maps using selected S-190 photographs, and will analyze them to determine what geologic information may be contained in them.

Task IV. The geological interpretations obtained in task 3 will be compared to interpretations obtained from S-192 imagery, and to interpretations made from ERTS-I imagery.

Task V. The geological interpretations will be verified by means of interpretation of aerial photographs, published geological reports, and field observations.

Task VI. The investigator will prepare recommendations for the optimum type, scale, and resolution of imagery to be used for studies of regional geology and exploration for mineral deposits and water resources.

Past Month's Activities

Research during June consisted mainly of continuations of studies

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begun under other research projects, and which will be extended and amplified with EREP data.

Mission planning activities consisted mostly of monitoring the daily progress of Skylab 2 through JSC telecorders. The PI was on site during the initial EREP pass over the Colorado test site (5 June 1973, Track 34).

Work continued on a final geologic map and report on the geology of the Bonanza Regional Geology Test Site (BRGTS). The BRGTS is an 1100 square mile area that will serve as one of the test sites for evaluating EREP data and comparing EREP data interpretations with ERTS-1 and aircraft data interpretaions. The final compilation is about 60% complete.

In anticipation of receipt of Skylab photography, a method of computer analysis of linears was developed and evaluated. The computer program does a strike frequency analysis of azimuths and length-weighted azimuths and produces graphs and a statistical analysis of trends. Data from Skylab ground tracks in Colorado were evaluated with this computer program. Linears extracted from ERTS images in the vicinity of the intersection of Skylab tracks 30 and 48 and several sets of ground observations of fracture attitudes in hand were analyzed. The technique of strike-frequency analysis is successful and has revealed some unexpected aspects of data gathering. Trends of linears extracted from imagery seem to be significantly biased by sun attitude or, in other words, shadow enhancement. Correspondence between linear trends and fracture trends will vary depending upon the angle between the sun azimuth in images or photographs and direction of fracture trends.

Planned Activities for Current Month

EREP data requirements will be reviewed in light of the accomplishments of Skylab 2.

Work on the final BRGTS map and report will continue.

Work will commence on compiling a photomosaic of the existing

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raised relief models of the test site, to be used for comparative regional geologic structure studies and for evaluating the effect of solar angle and elevation.

Recommendations

It would be most helpful to have access to a detailed account of the EREP data actually acquired, by sensor and, when available, the general quality, on all EREP passes. The telecorder messages are most helpful for following the current status, but leave much unanswered in terms of what data in detail, were obtained.

Travel

No travel costs were incurred during June. There are no travel plans for July.

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